

Job Risk Assessment (RA-02-1)

Document Control No.: RA-02-1		Date Assessment Completed: 8/28/2009		Location: Yerington Mine Site				<div><div>BROWN AND CALDWELL</div><div><div>BE-SHARP</div><div>BE AWARE AWARENESS AND RESPONSIBILITY PARTNERSHIP</div></div></div>			
Job Name: Monitor Well Sampling		Job Description: Set up sampling equipment at monitor well location.. Generally, dedicated pumps are installed in most wells, type of sampling equipment is dependent on well specifics. Non-dedicated equipment requires decontamination between uses. Water quality parameters are monitored during the purge phase; purge water is collected and disposed on-site. Collected samples must be packed and shipped to laboratories for analysis.		Risk Assessment Leader: Penny Bassett							
				Risk Assessment Team: Royanne Barringer, Briana Wright							
				SIMOPS: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Designated PIC:			

Work Plan (List Job Steps) List the jobs required to complete the project scope in the sequence they are carried out.	Any tools or heavy equipment needed?	Is this a SIMOP?	Do any of the Golden Rules of Safety apply?	Which of the 8 energy or biological root sources could possibly be involved in this job?	What would be the result of exposure to a biological or energy source? (e.g., Bites, Slips, trips falls, exposures, electrocution, injury, death, etc.); and How, where, or when could an uncontrolled release or unwanted contact with a biological or energy source occur? Note: Humans are biological sources, and their physical abilities, competency, and training should also be considered here.	Environmental Impacts Could there be a release to the air, soil or water, and or, will a waste be generated? If YES, What?	Pre-Mitigation Risk Evaluation				Permit(s) Required?	Energy / Biological / Waste Management Plan List control measures required to eliminate, control, or protect against unwanted contact with an uncontrolled biological or energy source to minimize the risk of injury or environmental impact. Hierarchy of Controls: Elimination, Substitution, Isolation, Engineering/ Administrative, PPE	Who is responsible for Hazard Mitigation?	Post-Mitigation Risk Evaluation			
	If YES, What Type	If YES, Include in Mitigation Plan.	If YES, Which of the 8?				Frequency	Consequence	Likelihood	Risk Score	If YES, What kind?		Name or Title	Frequency	Consequence	Likelihood	Risk Score
A. Calibrate water quality instruments - calibrate YSI for pH, conductivity, ORP, dissolved oxygen - calibrate turbidity meter	No YSI, turbidity meter	No	No	Chemical	Chemical... Calibration standard solutions may cause eye irritation if splashed, however none are high hazard chemicals with acute hazards. Very little hazard with skin contact. Uncontrolled disposal of used calibration solutions could impact disposal site.	Yes Calibration solutions	Frequent Exposure	Notable Consequence	Conceivable but unlikely	Minimal Risk	No	Chemical... Safety glasses should be worn when handling calibration solutions. Nitrile gloves are not required. Used solutions shall be collected in a labeled container and disposed in lined pond not in sink drain.	Sample Technician	Frequent Exposure	Notable Consequence	Conceivable but unlikely	Minimal Risk
B. Load field supplies in truck, drive to well location - water quality instruments - compressor, pump controller, generator, air hoses - compressed gas (CO2) - sample bottles, cooler - table, chair, umbrella	Yes Pickup truck, compressors, generator, compressed gas	No	Yes Driving Safety	Motion Gravity	Motion... Walking trip/slip hazards. Driving hazard on rough terrain and public roads include potential collision or loss of control. Trip distance is short and at neighborhood speed so the hazard is less significant. Unsecured loads in pickup truck bed can shift and cause property damage or fly out of moving vehicle. Gravity... Lifting heavy items may cause back or other injury. Access in/out of truck be by climbing on tailgate could result in fall, sprain.	No	Frequent Exposure	Serious Consequence	Unusual but possible	Substantial Risk	No	Motion... Maintain good housekeeping in supplies storage and loading area, remove tripping hazards. Ensure items are securely stored to prevent movement during transport, use tie-down straps for items with wheels or large heavy items (generator). Gravity... Use safe lifting techniques and get help for heavy/awkward lifts. Workers should use 3-point contact when getting in/out of truck bed and organize supplies to minimize need to enter.	Sample Technician	Frequent Exposure	Important Consequence	Remotely possible	Minimal Risk
C. General field location set up	No	No	No	Thermal Electrical Biological	Thermal... Weather conditions (heat & cold) may cause worker heat stress, cold stress, or dehydration. Electrical... Thunderstorms with lightning could result in potential lightning strike because locations are exposed and well monument can add to risk. Biological... Stinging insects (bees, spiders), scorpions, snakes, or domestic or wild animals can cause minor or significant injuries.	No	Occasional Exposure	Very Serious Consequence	Remotely possible	Low Risk	No	Thermal... Workers shall discuss weather conditions in morning safety meeting and develop appropriate action plan or modified work schedule. Shade should be made available for hot weather days. Insulating coveralls or coat should be available for cold weather work. Workers should have an adequate supply of drinking water for the entire day. Electrical... the Field Manager (or other worker) shall call a STOP WORK when lightning is visible. Workers should move to safe location or stay inside truck until storm has passed. Biological... Inspect work area for biological hazards before setting up. If a hazard is present either reschedule for a later time, remove the hazard, wear insect spray, etc.	Sample Technician	Occasional Exposure	Important Consequence	Remotely possible	Minimal Risk
D. Setup and pump water - Low-Flow Bladder Pump Three variations of setup include low-pressure electric compressor (powered by car battery), med-pressure gasoline compressor, or high-pressure CO2 compressed gas cylinder. - set up water quality instruments - manual measurement of water level - set up compressor & pump controller, adjust pressure/refill to pump water	Yes Compressor, car battery	No	No	Motion Electrical Chemical Pressure Thermal	Motion... Making connections to pump, controller and compressor have minor pinch points that could result in hand injury. Lowering water level meter into well could cause hand injury. Electric... Making connection to car battery could result in sparks or electric shock. Chemical... Gasoline refueling of compressor. Potential contaminated groundwater. Pressure... Pressurized air lines, compressed gas cylinder could result in sudden release of pressure and being struck by. Noise hazard from continuous exposure to compressor motor. Thermal... Fire potential from spilled gasoline on hot manifold. Burn to skin from inadvertent contact with heated part of compressor motor.	Yes Release of contaminated groundwater to soil or surface water	Frequent Exposure	Serious Consequence	Unusual but possible	Substantial Risk	No	Motion... Wear leather gloves during set up and all manual handling. Electric... Workers should receive training on property battery connection procedure, wear leather gloves and safety glasses. Chemical... Refuel in an open area to minimize inhalation of gasoline vapors. Purged groundwater should be containerized and not allowed to spill to the ground surface. Pressure... Air hoses and regulator should be inspected prior to use. Pressure relief valve on air compressor should be confirmed as operational. Either ear plugs should be worn or the compressor should be placed away from the work area. Thermal... Gasoline fuel equipment must be cooled for ~10 minutes before refueling. Wear leather gloves when handling hot equipment.	Sample Technician	Frequent Exposure	Important Consequence	Remotely possible	Minimal Risk
E. Setup and pump water - Peristaltic Pump Peristaltic pump is electric and runs off car battery or portable rechargeable battery. Dedicated or one-time use tubing is installed in well with weight attached to bottom, tubing is run thru pumping mechanism at well head. - set up water quality instruments - manual measurement of water level - turn on pump and adjust flow rate	Yes Peristaltic pump, car battery	No	No	Motion Electrical Chemical	Motion... Lowering water level meter or weighted tubing into well could cause hand injury. Electric... Making connection to car battery could result in sparks or electric shock. Chemical... Potential contaminated groundwater.	Yes Release of contaminated groundwater to soil or surface water	Occasional Exposure	Important Consequence	Unusual but possible	Low Risk	No	Motion... Wear leather or nitrile gloves when placing equipment in or out of well. Electric... Follow proper safety procedures when making connections to battery terminals. Chemical... Purged groundwater should be containerized.	Sample Technician	Occasional Exposure	Notable Consequence	Remotely possible	Minimal Risk
F. Setup and pump water - Electric submersible w/ portable generator Pumps are already in wells, electric generator needs to be transported to well to run pump. - load generator in truck or trailer - unload or unhitch trailer at well - turn generator on and allow to warm up - plug electric cord into generator and turn switch on - measure pumping rate using bucket	Yes Generator	No	No	Motion Gravity Electrical Chemical Pressure Thermal	Motion... Loading/unloading generator into trailer and hitching/unhitching trailer from truck can result in hand injury or property damage. Unsecured load in trailer can shift. Electric... Ungrounded generator operated from trailer can cause spark or electric shock. Contact with damaged wires can cause shock. Chemical... Gasoline refueling of generator. Pressure... Noise hazard from continuous exposure to generator. Thermal... Fire potential from spilled gasoline on hot manifold. Burn to skin from inadvertent contact with heated part of generator.	No	Unusual Exposure	Serious Consequence	Unusual but possible	Low Risk	No	Motion... Loading and hitching should be a 2-person job, wear leather gloves when handling equipment or tools. Use tie-down straps to secure generator in trailer or truck. Electric... Generator should be grounded to conductive metal in contact with the ground surface (e.g. steel well monument) when in operation and when refueled. Chemical... Refuel in an open area to minimize inhalation of gasoline vapors. Pressure... Ear plugs should be worn for prolonged exposure. Thermal... Gasoline fuel equipment must be cooled for ~10 minutes before refueling. Wear leather gloves when handling hot equipment.	Sample Technician	Unusual Exposure	Important Consequence	Remotely possible	Minimal Risk
G. Monitor water quality parameters & water level - set up YSI and flow-thru cell - attach pump discharge to flow cell - lower water level probe into well to measure depth to water - record parameters in field notes - collect purge water in 5-gal container	Yes YSI, Water level meter	No	No	Chemical	Chemical... Contact with contaminated groundwater could cause skin or eye irritation.	No	Frequent Exposure	Notable Consequence	Quite Possible	Low Risk	No	Chemical... Wear nitrile gloves and safety glasses when handling sampling equipment and discharge water. Purge water shall be containerized and disposed in a lined pond on site.	Sample Technician	Frequent Exposure	Notable Consequence	Remotely possible	Minimal Risk

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	If YES, What Type	If YES, Include in Mitigation Plan.	If YES, Which of the 8?		Note: Humans are biological sources, and their physical abilities, competency, and training should also be considered here.	Could there be a release to the air, soil or water, and or, will a waste be generated? If YES, What?	Frequency	Consequence	Likelihood	Risk Score	If YES, What kind?	List control measures required to eliminate, control, or protect against unwanted contact with an uncontrolled biological or energy source to minimize the risk of injury or environmental impact. Hierarchy of Controls: Elimination, Substitution, Isolation, Engineering/ Administrative, PPE	Name or Title	Frequency	Consequence	Likelihood	Risk Score
H. Fill sample containers After well has stabilized (per SOP requirements): <ul style="list-style-type: none">- fill laboratory sample containers- place labels on containers,- place samples in ice-chilled cooler,- fill out chain of custody paperwork.	No	No	No	Chemical	Chemical... Contact with contaminated groundwater could cause skin or eye irritation. Contact with nitric acid preservative (max volume if spilled is 2 ml).	No	Frequent Exposure	Serious Consequence	Unusual but possible	Substantial Risk	No	Chemical... Workers shall receive training on precautions when handling acid preserved sample bottles, including keeping bottles upright, pointing lid away from face when opening, keeping lids on bottle when not actively in use to prevent accidental spill. Wear nitrile gloves when handling unopened acid preserved bottles.	Sample Technician	Frequent Exposure	Notable Consequence	Remotely possible	Minimal Risk
I. Prepare dilute nitric acid decon solutions Pour ~50 ml concentrated nitric acid into 5-gal container of distilled water	No	No	No	Chemical	Chemical... Contact with potentially large volume of concentrated nitric acid when mixing dilute solution can cause 1st & 2nd degree burns to skin and eyes. Improper mixing can cause splattering and splashing.	Yes Spill of concentrated nitric acid	Occasional Exposure	Very Serious Consequence	Quite Possible	High Risk	No	Chemical... Preparation of dilute acid decon solution should only be done in the lab area where there is running water, safety shower and eyewash. PPE requirements include heavy green nitrile gloves (elbow length), splash goggles, face shield, and rain coat. Handling of concentrated acid should be done in well ventilated area and in the presence of another worker. Acid should be added to a container that is partially filled with water (acid to water NOT water to acid). Gravity... Used safe lifting procedure when handling heavy containers.	Sample Technician	Rare Exposure	Serious Consequence	Remotely possible	Minimal Risk
J. Decon reusable equipment Decon reusable pump and tubing with 4-step clean and rinse in buckets or tubes. Dilute acid solution must be mixed on site from a 1-gal concentrated nitric acid bottle. <ul style="list-style-type: none">1. Alconox w/ tap water2. Tap water rinse3. Dilute nitric acid (2%) with DI water4. DI water final rinse	No	No	No	Chemical Gravity	Chemical... Contact with dilute nitric acid can cause skin irritation. Gravity... Lifting & moving 5-gal buckets of decon solutions can cause back injury.	No	Occasional Exposure	Important Consequence	Quite Possible	Low Risk	No	Chemical... Preparation of dilute acid decon solution should only be done in the lab area where there is running water, safety shower and eyewash. PPE requirements include heavy green nitrile gloves (elbow length), splash goggles, face shield, and rain coat. Handling of concentrated acid should be done in well ventilated area and in the presence of another worker. Acid should be added to a container that is partially filled with water (acid to water NOT water to acid). Gravity... Used safe lifting procedure when handling heavy containers.	Sample Technician	Rare Exposure	Serious Consequence	Remotely possible	Minimal Risk
K. Dispose of purge water Collected purge water is disposed in one of the on-site lined ponds. Back truck up to pond embankment, dump water from 5-gal bottles onto pond liner from bed of truck or at ground level.	No	No	No	Chemical Motion Gravity	Chemical... Contact with contaminated groundwater could cause skin or eye irritation. Motion... Working near wet pond liner can cause slip on liner resulting in injury or fall into pond with potential drowning or contact with chemicals. Gravity... Lifting heavy items may cause back or other injury. Access in/out of truck be by climbing on tailgate could result in fall, sprain.	Yes Release of contaminated groundwater to soil or surface water	Frequent Exposure	Disastrous Consequence	Remotely possible	High Risk	No	Chemical... Wear leather or nitrile gloves and safety glasses. Motion... Workers shall avoid stepping on liner material and stay on dirt/gravel surface or in the bed of the truck. This is a 2-person task at all times. Gravity... Use safe lifting techniques and get help for heavy/awkward lifts. Workers should use 3-point contact when getting in/out of truck bed and organize supplies to minimize need to enter.	Sample Technician	Occasional Exposure	Serious Consequence	Remotely possible	Low Risk
L. Pack and ship samples to laboratory <ul style="list-style-type: none">- place samples in cooler with bagged wet ice;- place COC paperwork inside cooler;- tape cooler shut and place custody seals- shipping labels on outside- transport packed coolers to delivery service pick-up location	No	No	No	Motion Gravity	Motion... Potential for back strain from awkward body position leaning over coolers while packing. Gravity... Large coolers can weigh >70 pounds if fully packed resulting in heavy awkward lift and possible back injury.	No	Frequent Exposure	Important Consequence	Unusual but possible	Low Risk	No	Motion... Place coolers at waist height on a work table rather than on ground, this will provide more comfortable body position. Gravity... Use rolling table or hand cart to carry packed coolers from packing area to truck to keep heavy load at one level and avoid need to lift. Limit number of samples in a cooler to <50 lbs, request smaller coolers from lab if necessary.	Sample Technician	Frequent Exposure	Important Consequence	Remotely possible	Minimal Risk
M. Drift check water quality equipment at end of day Drift check task is similar to morning calibration.	Yes YSI, turbidity meter	No	No		Chemical... Calibration standard solutions may cause eye irritation if splashed, however none are high hazard chemicals with acute hazards. Very little hazard with skin contact. Uncontrolled disposal of used calibration solutions could impact disposal site.	Yes Calibration solutions	Frequent Exposure	Notable Consequence	Conceivable but unlikely	Minimal Risk	No	Chemical... Safety glasses should be worn when handling calibration solutions. Nitrile gloves are not required. Used solutions shall be collected in a labeled container and disposed in lined pond not in sink drain.	Sample Technician	Frequent Exposure	Notable Consequence	Conceivable but unlikely	Minimal Risk